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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,677	07/18/2003	Stephen Allen Johnson	3791-13-CON	3654

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EXAMINER

RINEHART, KENNETH

ART UNIT	PAPER NUMBER
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3749

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08/15/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/622,677	Applicant(s) JOHNSON ET AL.	
	Examiner Kenneth B. Rinehart	Art Unit 3749	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 March 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 24-26,33,34,36,44-66,68-88,90-110,112-132 and 134-141 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-26,33,34,36,44-66,68-88,90-110,112-132 and 134-141 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 3/24/08 have been fully considered but they are not persuasive. As evidenced by Niessen the fluid temperature and melting point are two different physical properties. Consequently, since the specification is silent as to the term "fluid temperature" the specification would not have reasonably conveyed to one of ordinary skill that the applicant was in possession of the subject matter at the time of filing. Moreover, in addition the specification does not refer to an ash cone test or of a height. The applicant's reference to the fluid temperature is based upon a height of an ash cone of no more than 0.0625 inches. As the specification does not refer to a fluid temperature or a height of an ash cone, the specification would not have reasonably conveyed to one of ordinary skill that the applicant was in possession of the subject matter at the time of filing. Therefore, any arguments concerning the ash fusion characteristics and equivalence of fluid and melting temperatures are not relevant. In response to the applicant's arguments concerning the open ended temperature range, the specification would not have reasonably conveyed to one of ordinary skill that the applicant was in possession of the subject matter at the time of filing. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 24-26, 33-34, 36, 44-66, 73, 78, 79, 80, 81, 87, 88, 95, 100, 101, 102, 109, 110, 122-124, 131, 132, 140-141 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 24, 87, 109, 131, 140-141 refer to the ash slag has a fluid temperature less than the fluid temperature characteristic of the ash slag or a second ash slag produced from combustion of/the solid fuel alone which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has not pointed out where the amended claim is supported, nor does there appear to be a written description of the claim limitation "the ash slag has a fluid temperature less than the fluid temperature characteristic of the ash slag or a second ash slag produced from combustion of/the solid fuel alone" in the application as filed. Claims 36, 45, 88, 110, 132 refers to the melting point of the second ash slag is less than 2600 degrees F, fluid temperature is less than 2600 which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has not pointed out where the amended claim is supported, nor does there appear to be a written description of the claim limitation "the melting point of the second ash slag is less than 2600 degrees F "; "fluid temperature is less than 2600 " in the application as filed.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 24, 25, 26, 33, 34, 36, 44-46, 47, 48, 49, 50-53, 55, 56, 61, and 62, 63, 64-66, 68, 69, 70, 71, 72, 73, 74, 76, 77, 82, 83, 84-86, 87, 88, 90-92, 93, 94, 95, 96, 98, 99, 104, 105, 106, 107, 108, 109, 110, 112, 113, 114, 115, 116, 117, 118, 120, 121, 126, 127, 128, 129, 130, 131, 132, 134, 135, 136, 137, 139, 140, 141 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benner (1955574) in view of Hepworth (4572085). Benner discloses introducing a solid fuel into the boiler, wherein the solid fuel is a coal (figure 1), iron containing material, at least partially combusting the solid fuel to produce an ash slag, wherein, in the at least partially combusting step, at least one of the following is true: (i) the ash slag has a fluid temperature less than a fluid temperature characteristic of the ash slag produced from combustion of the solid fuel alone; and (ii) the ash slag has a melting point less than the melting point of a second ash slag produced from the combustion of the solid fuel alone calcium content, sub-bituminous coal (page 1, lines 7-10, line 15), viscosity (page 3, lines 52-75), fluxes (page 2, line 1) reducing particle size (powdered coal), the iron-containing material is selected from the group consisting of ferrous oxide, ferric oxide, ferrous sulfide, ferric sulfide, and combinations thereof, iron oxides (page 1, lines 50-55), iron containing material is added to solid fuel before introducing the solid fuel (7, fig. 1). Hepworth teaches mill scale, iron oxides (col. 3, line 12), cyclone boiler, ash slag flows from boiler, wet bottom boiler, slag type (figs.), slag flows from wet bottom boiler (figs.) for the purpose of reducing operating costs and providing for complete combustion of coal. It

would have been obvious to one of ordinary skill in the art to modify Benner by including mill scale, iron oxides, cyclone boiler, ash slag flow from wet bottom boiler as taught by Hepworth for the purpose of reducing operating costs and providing for complete combustion of coal. It would have been obvious to one of ordinary skill in the art at the time the invention was made to having a sulfur content of less than about 1.5 wt.%, the ash slag has a viscosity of 250 poise produced from the combustion of the solid fuel and iron-containing material is at least 100 degrees Fahrenheit lower than the T250 temperature of the second ash slag produced from the combustion of the solid fuel alone, the melting point of the second ash slag is less than 2600 degrees F, about 300 microns, 10lb/ton, 20 lb/ton, 15 weight percent, 10 wt %, at least about 33.5% of the iron-containing additive is in the form of ferrous iron and no more than about 66.5% of the iron in the additive is in the form of ferric iron, magnetite since where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. As evidenced by Kalb (5046265) (col. 1, lines 16-24) the low sulfur content with low iron content and high alkali content coal is desirable for reduction of SO<sub>2</sub> emissions. The applicant is merely combining prior art according to known methods to yield predictable results.

Claims 57, 58, 78, 79, 100, 101, 122, 123 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benner (1955574) in view of Hepworth (4572085) as applied to claims 24, 68, 90, 112, above, and further in view of Khan (4886521). Khan teaches hydrocarbon, oil grease and xanthum gum (col. 1, lines 65-72, col. 2, lines 1-32) for the purpose of promoting removal of the slag. It would have been obvious to one of ordinary skill in the art to modify Benner by

including hydrocarbon, oil grease and xanthum gum as taught by Khan for the purpose of promoting removal of the slag. The applicant is merely combining prior art according to known methods to yield predictable results.

Claims 59, 60, 80, 81, 102, 103, 124, 125, are rejected under 35 U.S.C. 103(a) as being unpatentable over Benner (1955574) in view of Hepworth (4572085) as applied to claim 24, 68, 90, 93, 112 above, and further in view Pirsh (3896746). Benner discloses introducing the iron containing material. Pirsh teaches device (87), burner (fig. 2), fuel transfer system (fig. 2), chamber (fig. 2), bunker (76) for the purpose of reducing the size of the fuel. It would have been obvious to one of ordinary skill in the art to modify Benner by including device, burner, fuel transfer system, chamber, bunker as taught by Pirsh for the purpose of reducing the size of the fuel so that the fuel burns more efficiently. The applicant is merely combining prior art according to known methods to yield predictable results.

Claims 54, 75, 97, 119 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benner (1955574) in view of Hepworth (4572085) as applied to claim 24, 68, 90, 112 above, and further in view Arai et al (4089507). Arai teaches dust (col. 1, lines 18—32) for the purpose of reducing pollutant problems. It would have been obvious to one of ordinary skill in the art to modify Benner by including dust as taught by Arai for the purpose of reducing pollutant problems. It is noted that there are a limited number of choices available to one of ordinary skill in the art for supplying iron oxide at low cost. In this regard it is noted that Arai teaches this low cost supply.

Claims 68, 69, 71-74, 77-81, 84, 85, 90, 91, 93, 94, 95, 96, 99, 100, 102, 103, 106, 107, 112, 113, 115, 116, 117, 118, 121, 122, 124, 125, 128, 129, 134, 137, 69, 70, 75, 76, 82-83, 85-86, 89, 92, 97-98, 101, 104-105, 108, 111, 114, 119-120, 123, 126, 127, 130, 133, 135-136, 138, 139 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hepworth (4572085) in view of Kober et al (4498402). Hepworth discloses the boiler and iron containing material and at least partially combusting the ash slag (fig. 1, col. 3, line 12), iron bearing material fluxes ash slag having a melting temperature less than the melting temperature of the ash slag produced from the combustion of the solid fuel alone, viscosity, melting at least a portion of the coal-containing fuel to produce an ash slag, wherein, in the melting step, at least a portion of the iron-containing additive fluxes the ash slag to produce a slag layer having a melting point less than a melting point of an slag layer without the iron-containing additive (This inherently occurs. In chemistry it is elementary that the use of the same reactants under the same conditions in the same reactor will produce the same results.) cyclone boiler (fig. 1), composite ash slag has a viscosity (fig. 1) particle size reduction (inherent), magnetite (col. 4, line 59) one carbon compound (col. 3, line 12), a particle size reduction ( inherently the fuel comes form a pulveriser), a burner (fig. 1), a fuel transfer system (fig. 1), combustion chamber (fig. 1), introducing the iron containing material (fig. 1), a fuel storage bunker (col. 3, line 8), the iron bearing material is added to the solid fuel (col. 3, lines 10-15), sub bituminous (col. 1, line 52). Hepworth discloses applicant's invention substantially as claimed with the exception of low sulfur, the coal has a total content of less than about 10 wt % (dry basis of ash) and wherein the coal has a calcium content of at least about 15 wt % (dry basis of ash), wherein the low sulfur coal has a total sulfur content of less than about 1.5 % wt (dry basis of coal), P90 size of about 300 microns, dust form blast furnace



gas cleaning equipment, ferrous oxide and ferric oxide ferrous sulfide, ferric sulfide, and combinations thereof, introducing at least one carbon compound along with the iron bearing material, hydrocarbon, oil and grease Xanthum gum, iron bearing material is introduced into the boiler an amount ranging form 10lb/ton of solid fuel to about 20 lb/ton, 50 lb/ton of solid fuel, 15 weight percent, the at least one ash fusion temperature characteristic is less than 2600 F, less than 1.5 wt %, 33.5 % and 66.5 %. Kober et al teaches low sulphur (col. 2, line 10) to meet environmental requirements. It would have been obvious to one of ordinary skill in the art to modify Hepworth by including low sulphur as taught by Kober for the purpose of meeting environmental requirements. Hepworth in view of Kober discloses applicant's invention substantially as claimed with the exception of P90 size of about 300 microns, dust form blast furnace gas cleaning equipment, ferrous oxide and ferric oxide ferrous sulfide, ferric sulfide, and combinations thereof, introducing at least one carbon compound along with the iron bearing material, hydrocarbon, oil and grease Xanthum gum, iron bearing material is introduced into the boiler an amount ranging form 10lb/ton of solid fuel to about 20 lb/ton, 50 lb/ton of solid fuel, 15 weight percent, the at least one ash fusion temperature characteristic is less than 2600 F, less than 1.5 wt %, 33.5 % and 66.5 %. It would have been obvious to one of ordinary skill in the art at the time the invention was made to P90 size of about 300 microns iron bearing material is introduced into the boiler an amount ranging form 10lb/ton of solid fuel to about 20 lb/ton of solid fuel, 50 lb/ton, 15 weight percent, the at least one ash fusion temperature characteristic is less than 2600 F, less than 1.5 wt %, 33.5 % and 66.5 % since it has been held that the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges or values involves only routine skill in the art. It would have been obvious to one of ordinary

skill in the art at the time the invention was made to have another type of iron bearing material or ferrous oxide and ferric oxide and ferric oxide ferrous sulfide, ferric sulfide, and combinations thereof, the at least one carbon compound being of a specific type of one or more of a hydrocarbon, oil, grease, and xanthum gum, because applicant has not disclosed that the type of iron bearing material, type of carbon provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the type of material of Hepworth or the claimed type because both materials perform the same function equally well. The applicant is merely combining prior art according to known methods to yield predictable results.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth B. Rinehart whose telephone number is 571-272-4881. The examiner can normally be reached on 7:10 -4:10.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

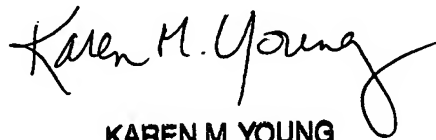
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Kbr

/Kenneth B Rinehart/  
Primary Examiner, Art Unit 3749

  
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